

### **REMARKS/ARGUMENTS**

Claims 1-3, 7-14, 17-21, 23, 29-30, 32-41, 44-45, 51-53, 56, and 132-140 remain in this application. Claims 1, 2, 7, 9, 10, 23, 30, 32, 33, 34, 39, 51, 56, 132, 139, and 140 have been amended. Claims 4-6, 15-16, 22, 24-28, 31, 42-43, 46-50, 54-55, 57-131 have been canceled.

#### **1. § 112 Rejections**

The Examiner has rejected claims 1-3, 7-14, 17-21, 23, 29-30, 32-44, 45, 51-53, 56, and 139-140 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner asserts that “the claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.” (Office Action, page 2).

According to the Examiner, in claim 1, “there is no support for the steps of providing and contacting . . . . Claims 2, 30, and 51 lack support for substantially the same reason” (*Id.*). Applicants submit that this rejection is traversed in view of amended claims 1, 2, 30, and 51.

According to the Examiner, claim 139 “refers to having the glass doped with the gas. Literally, it would mean, for example, the molecule CF<sub>4</sub> resides in the glass. There is no support for this.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claim 139.

The Examiner has rejected claims 1-3, 7-14, 17-21, 23, 29-30, 32-44, 45, 51-53, 56, and 139-140 under 35 U.S.C. § 112, second paragraph, “as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” (Office Action, page 3).

According to the Examiner, claim 1 “requires providing an atmosphere to a soot preform, and another step of contacting the preform with the atmosphere. It is unclear if these two steps are the same thing, or if they are separate steps. . . . Claims 2, 30, and

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51 are indefinite for substantially the same reason.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claims 1, 2, 30, and 51.

According to the Examiner, “there is no antecedent basis for ‘the step’ (and variations of the/said step/steps) throughout the claims.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claims 1, 30, 32, 33, 34, 51, 132, 139, and 140.

According to the Examiner, it “is unclear what is meant by ‘at least partially refilling the vessel.’” (Office Action, page 4). Applicants submit that this rejection is traversed in view of amended claims 1, 2, 9, and 30.

According to the Examiner, claim 139 “at line 8 requires ‘maintaining the soot preform in contact with the first gaseous atmosphere’ – however line 4 indicates it is the gas that is in contact with the preform.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claim 139.

According to the Examiner, “line 10 of claim 139 refers ‘partially doped’ – it is unclear what is meant by this since any amount of dopant means it is doped.” (Office Action, page 5). Applicants submit that this rejection is traversed in view of amended claim 139.

According to the Examiner, claim 139 “also requires that the preform is doped with the first gas; it is unclear if it should be interpreted as being doped by the gas, or if it actually means the dopant molecule stays as the molecule in the preform. At least claim 140 is indefinite for the same reasons claim 139 is.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claims 139 and 140.

According to the Examiner, in claim 10, “there is confusing antecedent basis for ‘reductions’ – it is unclear if this is in addition to the decrease of claim 1. It is unclear if there must be reductions in addition to the decrease. There is confusing antecedent basis for ‘dopant gas’ – claim 1 already sets forth that the gas is doped into the glass, it is unclear if claim has double inclusion of the same step.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claim 10.

According to the Examiner, claim 23 “sets forth that there is heating occurring during the reaction times. However, claim 23 depends from claim 1 which indicates that the maintaining of the temperature is ‘for a first reacting time.’ It is not understood

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how the temperature could be maintained at the same time it is being raised.” (*Id.*)

Applicants submit that this rejection is traversed in view of amended claim 23.

According to the Examiner, “there is confusing antecedent basis for ‘pressurization’ in claim 39. It is unclear if it is limited to the pressurizing of claim 30.” (*Id.*) Applicants submit that this rejection is traversed in view of amended claim 39.

## **2. § 103 Rejections**

The Examiner has rejected claims 1-3, 7-14, 17-21, 23, 29-30, 32-44, 45, 51-53, 56, and 139-140 under 35 U.S.C. § 103(a) as being unpatentable over Kyoto (5158587) alone, or in view of Walker (4178347), Dobbins (5043002), Biswas (4575463), Simms (4339256) and Korenowski (4118295).

The Examiner asserts that “Kyoto discloses the providing step and all of the contacting step, except for the flow rate limitation and the decreasing partial pressure. Kyoto’s example 2 also does not disclose the evacuating, refilling and additional contacting step. . . . Kyoto also teaches doping without any gas flowing out. Alternatively: it would have been obvious to have no gas flowing out, because if any gas flows out, the pressure is not being maintained. Moreover, in light . . . of Walker, the gas is corrosive and noxious – which provides motivation to use the not-preferred method – i.e. to create less corrosive and noxious gas. See also Dobbins . . . which discloses that use of halides can be very expensive in terms of pollution abatement and equipment losses. It is noted that it is inherent that the partial pressure would decrease – clearly, since the fluorine is doped into the glass, the amount of fluorine in the gas would be reduced, which would cause the partial pressure to decrease. See also instant claim 10 which indicates reactants are consumed. As to the evacuating and refilling, it would have been obvious to purge the gas, and refill it so to provide more fluorine. It is generally not invention to replenish a spent source. Thus it would also be obvious to use a batch process, semi-batch, or semi-continuous process in light of a continuous process. In other words, in light of Kyoto’s teaching to fill the vessel once, or continuously supply and evacuate the reactant, it is not invention to supply the necessary fluorine compound in two batches”.

Applicants submit that the rejection is traversed. As acknowledged by the Examiner, several limitations of independent claim 1 (and other independent claims) are not taught or suggested by Kyoto. For example, Kyoto fails to teach or suggest that no more than 0.5 slpm of a first gaseous atmosphere flows out of a vessel during a first reacting time. Kyoto also fails to teach or suggest a first halogen-containing gas that has a partial pressure which decreases during a first reacting time. In addition, Kyoto fails to teach or suggest evacuating at least a portion of a first gaseous atmosphere from a vessel. Moreover, Kyoto does not teach or suggest providing a vessel with a second gaseous atmosphere including a second halogen-containing gas. Accordingly, at least this combination of steps outside of the disclosure of Kyoto would be required in order to meet the recitation of, e.g., claim 1.

The Examiner asserts that a halogen-containing gas that has a partial pressure which decreases during a first reacting time is inherent from the teachings of Kyoto. Applicants disagree. As stated in the MPEP, "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (MPEP § 2112, citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). Here the Examiner has failed to meet the required *prima facie* burden that the teaching of Kyoto would necessarily result in a halogen-containing gas that has a partial pressure which decreases during a first reacting time.

To the contrary, persons of ordinary skill in the art would recognize that Kyoto would not result in a halogen-containing gas that decreases in partial pressure during a first reaction time because Kyoto repeatedly emphasizes processing conditions under which the *pressure or concentration of SiF<sub>4</sub> remains constant during reaction*. For example, Kyoto teaches a vessel "containing pure SiF<sub>4</sub> under pressure of 4 atm. at 1,100° C. for 2 hours." (Kyoto, col. 4, ll. 16-19). Kyoto teaches that such constant pressure of SiO<sub>4</sub> can be maintained during reaction by *continually flowing SiF<sub>4</sub> into the reaction vessel* (see, e.g., Kyoto, col. 4, ll. 30-32 ("porous silica glass deposited

around the core was heated at 1,100°C under 2 atm. for one hour with flowing SiF<sub>4</sub> at a rate of 2 l/min.”). Kyoto further emphasizes that due to the continual flowing of SiF<sub>4</sub> to the preform, the reaction rate of fluorine is not decreased during reaction, which would indicate a non-decreasing partial pressure of SiF<sub>4</sub>, all other rate-affecting reaction conditions being equal (*see, e.g.*, Kyoto, col. 4, ll. 48-51 (“When SiF<sub>4</sub> is continuously flowed during the addition of fluorine to the porous soot preform, the reaction rate of fluorine is not decreased and less bubbles are formed in the preform.”)).

Moreover, persons having ordinary skill in the art would not be motivated to modify the teachings of Kyoto to provide for a halogen-containing gas that decreases in partial pressure during a first reaction time for at least the reason that such modification would render Kyoto unsatisfactory for its intended purpose. “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” (MPEP § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984))). Kyoto emphasizes that an intended purpose of his invention is to provide a glass preform with fewer or no bubbles therein:

One object of the present invention is to provide a method for producing a glass preform containing fluorine in an increased amount with fewer or no bubbles therein.

(Kyoto, col. 2, ll. 45-48). Kyoto then teaches that this purpose is achieved by providing a optimum reaction rate, which is not decreased during reaction, by constantly providing fresh SiF<sub>4</sub> to the reaction vessel (*see, e.g.*, Kyoto, col. 3, ll. 42-43) (“By continuously providing fresh SiF<sub>4</sub> in the vessel an optimum reaction rate can be maintained”); col. 4, ll. 48-51 (“When SiF<sub>4</sub> is continuously flowed during the addition of fluorine to the porous soot preform, the reaction rate of fluorine is not decreased and less bubbles are formed in the preform.”)) Accordingly, modifying Kyoto to provide decreasing partial pressure of SiF<sub>4</sub> during reaction would render Kyoto unsatisfactory for its intended purpose and, hence, no motivation exists to modify Kyoto to provide for such.

The Examiner further asserts that Kyoto teaches doping without any gas flowing out. However, the cited portion of Kyoto does not teach this (*see*, Kyoto, col. 2, l. 63

("Preferably, SiF<sub>4</sub> is flowed in the atmosphere"). In addition, Applicants submit that a given pressure can be maintained while gas is flowing out provided that a compensating amount of gas is being flowed in. And, as discussed above, continuously flowing in fresh SiF<sub>4</sub> during reaction is precisely what Kyoto teaches (*see, e.g.*, Kyoto, col. 3, ll. 43-44 ("By continuously providing fresh SiF<sub>4</sub> in the vessel an optimum reaction rate can be maintained."); *see also* Kyoto, col. 4, ll. 30-32 ("porous silica glass deposited around the core was heated at 1,100°C under 2 atm. for one hour with flowing SiF<sub>4</sub> at a rate of 2 l/min.")). Therefore, the fact that Kyoto teaches maintaining a given pressure during reaction does not mean that the reference teaches doping without any gas flowing out, let alone that no more than 0.5 slpm of a first gaseous atmosphere flows out of a vessel during a reacting time.

Applicants further submit that persons having ordinary skill in the art would not have been motivated to combine any of the secondary references with Kyoto in order to obtain the claimed invention. For example, Walker relates to "the simultaneous manufacture of wet process phosphoric acid and sodium silico-fluoride" and more particularly to the "recycling of waste-water streams, such as gypsum pond water, to recover P<sub>2</sub>O<sub>5</sub>, fluoride and silica values contained therein." (Walker, col. 1, ll. 8-14). Thus, Walker relates to entirely non-analogous art and persons having ordinary skill in the art would find little to no application of the process conditions of Walker to the process conditions of Kyoto. In addition, the cited portion of Walker relates to the elimination of moisture into an atmosphere containing SiF<sub>4</sub> gas and not the reduction of SiF<sub>4</sub> gas itself (*see*, Walker col. 3, ll. 14-26).

Similarly, Dobbins relates to non-analogous art, namely the utilization of "halide-free, silicon-containing compounds as a replacement for the halide-based source feedstocks that are often oxidized by flame hydrolysis or pyrolysis to produce transparent, high purity silica glass articles." (Dobbins, col. 3, ll. 3-7; *see also* Dobbins, col. 2, ll. 37-40 ("The novelty of the invention described herein lies in the replacement of SiCl<sub>4</sub> in vapour deposition processes with a halide-free, silica-source compound, thus greatly reducing, if not eliminating, the production of HCl.")). Moreover, use of a halide-free source as taught by Dobbins (i.e., complete replacement of a halide-containing reactant) would render Kyoto unsatisfactory for its intended purpose because

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Kyoto specifically emphasizes the use of  $\text{SiF}_4$ . Therefore, for this additional reason there would be no motivation to combine the references.

In addition, persons having ordinary skill in the art would not be motivated to evacuate at least a portion of a first gaseous atmosphere from a vessel and then provide the vessel with a second gaseous atmosphere in view of Biswas. Biswas relates to the application of a primary and secondary coating on an already drawn optical fiber and does not teach or suggest providing a first gaseous atmosphere to a vessel, at least partially evacuating the first gaseous atmosphere from the vessel, and then providing a second gaseous atmosphere to the vessel.

Persons having ordinary skill in the art would also not be motivated to modify the teachings of Kyoto in view of Simms or Korenowski. Simms relates to the non-analogous art of making ophthalmic polarized glass for sunglass lenses and Korenowski relates to the non-analogous art of regenerating mixtures of chromic and sulphuric acids that are used for etching plastics prior to metallic plating.

Accordingly, Applicants submit that independent claims 1, 30, 51, 132, 139, and 140 are patentable over the cited references. Applicants further submit that all claims depending from these claims are patentable over the cited references.

Moreover, Applicants submit that claim 18 is patentable over the cited references for at least the reasons discussed above and for the additional reason that Kyoto teaches away from the reaction set forth in equation 2 (Kyoto, col. 3, ll. 43-47 (“By continuously providing fresh  $\text{SiF}_4$  in the vessel an optimum reaction rate can be maintained. This may be due to the fact that the dissociation reaction represented by the following reaction formula (2) could be suppressed.”)).

In addition, Applicants note that the Examiner has taken Official Notice with regard to the recitation in dependent claim 11 “including pressurizing an outer surface of the vessel to offset pressurization within the vessel”, dependent claim 12 “including supporting a reinforcing sleeve about the vessel during at least the first and second reacting times”, and dependent claim 29 “wherein the first and second gaseous atmospheres each include an inert gas selected from the group consisting of He, Ar, Ne, and  $\text{N}_2$ .” In response, Applicants note that “Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be

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well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known.” (MPEP § 2144.03). In addition, “assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art.” (*Id.*) Moreover, “[i]f the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding.” (*Id.*) Here Applicants submit that the Examiner has not established that pressurizing an outer surface of a vessel and supporting a reinforcing sleeve about a vessel are capable of instant and unquestionable demonstration as being well-known in the art of manufacturing optical fiber preforms. In addition, Applicants submit that it would not have been obvious to use inert gas with the Kyoto halide because Kyoto emphasizes a vessel “containing pure SiF<sub>4</sub>.” (Kyoto, col. 4, l. 17); *see also* Kyoto, claim 1 (“heating the complex glass preform in an atmosphere consisting of SiF<sub>4</sub>”).

Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

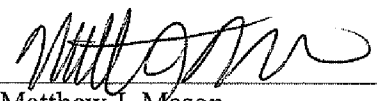


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Please direct any questions or comments to Matthew J. Mason at 607-974-9993.

Respectfully submitted,

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